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ABSTRACT

A framework is presented that relates concepts of audit reliability to the uses of information gathered from a discrepancy program audit of Elementary and Secondary Education Act Title IV-C programs in Florida. Three issues are addressed: (1) the meaning of reliability in relation to the audit process; (2) the importance of reliability of auditor judgments in a program auditing system; and (3) the minimum level of interjudge reliability necessary in an audit. The first dimension of the audit framework is audit content--areas of program development and management for which quality control is essential--including management; development; demonstration; developmental evaluation; and demonstration evaluation. The second dimension identified five considerations which determine the relationship among the audit's content areas and auditor reliability: purpose in auditing the content area; uses of audit information; possible sources of unreliability; importance of reliability for the content area; and level of reliability necessary for the content area. (Each of these components is explained, and illustrations from Florida's system of auditing federally funded Title IV-C programs are provided). (GDC)

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Framework for Relating Auditor Reliability to Information Uses

by

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Introduction

The increasing pressure for accountability in federal educational program expenditures has created a demand for auditing or monitoring programs funded through federal monies. In response to this demand, a variety of program auditing or monitoring systems have been developed at the state and local levels to meet federal requirements and to provide information for decision-makders who are accountable for the funds. Some states employ full-time personnel for on-site visits of programs. Other states utilize contracts with qualified personnel to implement program audits independently. The use of information from these program audits is dependent, in part, upon the reliability of the results presented by the program auditors. Confidence in the decisions made by program auditors is strongly affected by the reliability or consistency of the decisions produced. The purpose of this study was to develop a framework for relating concepts of reliability to the uses of information from a program discrepancy audit. This study was conducted in conjunction with an empirical study examining some portions of the framework.

Methodology

Three research issues were addressed in the development of the framework. These issues were (a) the meaning of reliability in relation to the audit process, (b) the importance of reliability of auditor judgments in a program auditing

system, and (c) the minimal level of inter-judge reliability necessary for program auditors in relation to audit purposes.

After reviewing existing documents on functioning audit systems, it was apparent that one of the most comprehensive and detailed systems was the ESEA Title IV-C auditing system. This study utilized the Florida ESEA Title IV-C program auditing system as the basis of the development of the framework. The following procedures were used to develop the framework:

1. Analysis of the audit system to identify the dimensions of the audit process to be considered in relation to the concept of reliability,
2. Examination of the developed dimensions to determine the importance of reliability in relation to possible uses of the information,
3. Formative evaluation of the framework by auditors, project directors, and state-level decision-makers, and,
4. Revision of the framework.

Results

Two dimensions of the framework were derived from an in-depth study of the Florida ESEA Title IV-C audit system. The first was the audit content, which corresponded to broad areas of program development and management for which quality control was considered essential. These audit content areas were management, development, demonstration, developmental evaluation, and demonstration evaluation.

The second dimension developed for the framework consisted of five considerations identified as necessary in determining the relationship among the audit content areas of the first dimension and the reliability of auditor judgments. These considerations were derived through a logical analysis of

the concept of reliability in relation to the audit process. The considerations were the

1. Purpose in auditing the content area,
2. Uses of information from the audit of the content area,
3. Possible sources of unreliability in auditing the content area,
4. Importance of reliability for auditing the content area, and
5. Minimum level of reliability necessary for the content area.

The two dimensions of the framework are presented in Figure 1 with extracts from the analysis of the inter-relationships among the elements. The audit content areas are presented as row headings, and the audit information uses considerations constitute the column headings.

The analysis of each element within the framework is presented in order by audit information use considerations, the column headings in Figure 1. All content areas are examined for a given audit information use consideration, prior to continuing with the next consideration. In some instances, the analysis of an audit information use consideration revealed duplicative functions for several content areas. To avoid repetitive statements, these analyses were combined across content areas.

Purpose in Auditing the Content Area

Describing the purpose in auditing a content area gave direction to the development of other audit information use considerations for the content areas. In addition, the role of the given content area within the management system was specified. The purposes for auditing the content areas were:

Audit Content Areas	Purposes in Auditing	Uses of Information from Auditing	Sources of Unreliability		Importance of Reliability	Minimum Level
			General	Specific		
Management	To verify accuracy of work plan, ensure effective management system and effective communication system	A. Local level 1. change procedures 2. request tech. asst. 3. engage consultant 4. contest need for change 5. recommend termination of project B. State level 1. follow-up monitoring 2. technical assistance 3. recommend consultant 4. terminate funding 5. examine audit requirement 6. produce explication in grant manual 7. short presentation state-wide 8. long presentation state-wide 9. change audit requirement 10. eliminate audit requirement	Personal bias Insufficient evidence Poor criteria Differing individual opinions	sampling of work activities; determining internal consistency of management system; lack of familiarity with target groups; intra-staff dissension	minor variations can cumulate in project-threatening events; poor communication can damage both developmental and demonstration projects.	.7
Development	To ensure adequate process design and product design and construction			amount of detail needed for design of program and delivery system; sampling of products	without good basic design, there is no reason for implementing; costly revisions result from inadequate product construction	.8
Demonstration	To verify availability and quality of training materials and consumer products and effectiveness of delivery service			sampling of training materials and consumer wares, need for detailed cost information; identification of overload areas	inadequate consumer or demonstrator wares reduce effectiveness of demonstration; poorly planned or implemented service system is fatal	.8
Developmental Evaluation	To verify existence and quality of evaluation design, measures of change, and procedures			adequacy of structure of design; differing views on violation of assumptions for data analysis	if evaluation design, measures, and procedures are inadequate, the best of products may never be recognized as outstanding	.9
Demonstration Evaluation	To verify collection and use of information about service quality and market impact			sampling of consumer records; analysis of consumer rating data; use of consumers as the source of information	consumer reaction data is essential to diagnosing inadequate service delivery; market impact data is culmination of 3-6yrs of fed. funds	.6

Figure 1. Framework for relating reliability considerations.

1. Management. To verify the accuracy of and congruence among the project's work plan, work schedule, and records of implemented activities. To ensure an effective management system through determination that the work plan is viable, the work schedule and work packages are viable and derived from the work plan, the personnel assigned to the tasks are qualified and capable of performing the tasks, and the records indicate that planned activities are occurring on time. To ensure effective internal and external communications and verify that vital project information is adequately stored, protected, and retrievable.

2. Development. To ensure compatibility and integrity in the design of the solution to identified problems. To verify inclusion of a planned delivery system that describes detailed product specifications, and that considers and measures compatibility of the delivery system within the local school district. To verify that the project uses product specifications, extensive product testing and control, and production schedules that ensure timely development.

3. Demonstration. To verify that the project has (a) well-constructed, technically reviewed, and available training materials for demonstrating the program; (b) exportable, attractive, easy-to-implement consumer products; and (c) an inventory system. To verify that the project is delivering services in the areas of consumer awareness, program demonstration, training of personnel, monitoring of adoptor usage, and technical assistance.

4. Developmental evaluation. To determine that the scope of the planned evaluation design includes the effect of the program on students, any attending side effects of the program, the affordability, organizational and social compatibility, ease of use, exportability, and degree of problem resolution of the program. To verify that the structure of the design provides operational definitions of all variables, explanations of any threats to validity, and

decision criteria. To verify that the stated objectives were derived appropriately, can be adequately measured, and have specified instruments planned for the measurement of the objectives that are sensitive, valid, and reliable. To determine whether the project has planned and is employing procedures for conducting the evaluation that include samples large enough to permit inferences for other groups, systematic and reliable data collection, appropriate data analysis, verification and management systems, and a detailed evaluation schedule.

5. Demonstration evaluation. To verify that the project has established and is using a detailed record-keeping system of consumer transactions. To verify that the response times of the project to demands for service are within established criteria. To verify that the project collects from the consumer and uses ratings of demonstrator service quality. To verify that the project collects and uses impact information.

Uses of Information from the Audit

Examination of how information from audits of various content areas was used revealed many similarities, regardless of the content area analyzed. The information from an audit, that is, the detection of consistency with or discrepancies from standards, serves as a screening device for detecting problems in a project that can then be addressed and solved. The process of solving a problem occurs at two levels, the project or local level and the state level.

The local or project level uses of audit information were to:

1. change procedures or revise documents,
2. request technical assistance from the state office,
3. engage consultant expert to remediate the problem,
4. contest the need for a change in project procedures, or
5. recommend termination of project funds.

At the state level, the activities were grouped into activities for individual projects and activities for participants from several projects. The first four state-level uses of audit information are activities responding to problems on individual projects. The last six activities are those which are appropriate when more than one project encounters the same problem. The state-level uses of audit information are:

1. follow-up monitoring to assess efforts by individual project to implement solutions,
2. individual technical assistance through analyzing the problem area and providing a workable plan for remediation,
3. recommend consultant expert in the problem area to analyze the problem and provide and/or implement a solution,
4. terminate funding of the project if all attempts to remediate problems have failed.
5. examine the audit requirement to ensure the requirement is necessary,
6. produce an explication in the grant manual for managers,
7. provide a short presentation at a state-wide meeting on the subject giving suggested solutions,
8. provide a long presentation at a state-wide meeting for project managers in the subject area.
9. change the audit requirements to reflect more directly the grant manual,
10. eliminate the audit requirement if the content area is judged non-essential.

The previous description has concentrated on the uses of information from an audit to change or improve specific aspects of a program. In addition to these uses, two other uses of information from program auditing were noted. First, evidence reported in an audit of outstanding or exemplary activities is employed by local and state level personnel to publicize project activities.

Thus, positive comments resulting from an audit serve a public relations function.

Second, negative comments and recommendations for change are used at the local level in a political setting to alter situations related to the project. These alterations are frequently beneficial to the project; however, the negative audit findings can be used to detract from the project. If auditors have accurately assessed the situation, the result may be beneficial to the project. If the auditors are in error, inappropriate change may result. Although the political and public relations functions are not the intended uses of the information from a program audit, they are frequently very important unanticipated outcomes.

Sources of Unreliability.

Reliability of rater judgments, test scores, and other measures of educational phenomena is usually defined in terms of the consistency of the scores derived from the measures. Examination of the Florida ESEA Title IV-C discrepancy audit system revealed several sources of error contributing to the inconsistency or unreliability of auditor judgments. Four general categories were detected in the analysis of sources of unreliability. Each audit content areas was also examined to determine specific areas within the content that would most heavily contribute to variation either within or among auditors.

General sources of unreliability were:

1. Personal bias. Although detailed audit protocols and audit training sessions should standardize the audit process, the personal biases of the auditor may affect many audit decisions. Typical biases are those for or against the subject area of the project, the processes used in the program, and the personalities of staff members.

2. Insufficient evidence. Insufficient evidence due to lack of availability or lack of preparation by the auditor may result in inconsistent judgments.

3. Poor criteria. If the criteria stated for the examination of the content area are vaguely or ambiguously phrased, judgments may differ, according to the interpretation of the auditor.

4. Differing individual opinions. In some content areas, auditors may make judgments based on different professional opinions that reflect divergence within the professional community. An example of this type of honest difference is the use of analysis of variance as a data analysis technique to determine differences among treatment groups when random assignment to groups was not employed. Differing individual opinions may also be reflected in the degree of strictness utilized in the application of the audit criteria to a project.

Specific sources of unreliability include:

1. Management. Sampling of work activities may result in a distorted picture of sequences. There may be inter-auditor variation in determining the severity of minor discrepancies and intra- and inter-auditor variation in determining the internal consistency of the management system. Auditors may be unfamiliar with target groups, resulting in misjudgments on the effectiveness of communication. Intra-staff dissension may bias the auditor's perception of external communication efforts as well as other elements of project management.

2. Development. Inter-auditor variation may result from determining the detail necessary for the design of program and delivery systems. Sampling of products may result in a distorted view of the production system.

3. Demonstration. Sampling of wares may result in a distorted view of the adequacy of service aid production and inventories. Auditors may vary in the degree of detail necessary for cost information. Lack of experience in project management may result in variation on the determination of overload areas.

4. Developmental evaluation. Inter-auditor variation may result from (a) determining the adequacy of the structure of the design, (b) determining the appropriateness and sensitivity of the measuring instruments, (c) differing views of the need to meet assumptions for data analysis techniques, and (d) differing views on the necessity for random sampling. Lack of subject matter expertise may result in inter-auditor variation about the adequacy of the basis of objectives.

5. Demonstration evaluation. Inter- and intra-auditor variation may be due to differences on what constitutes analysis of consumer rating data for evaluation and decision-making. Sampling of consumer records may result in a distorted view of response times. Use of consumers as sources of information may result in differences due to consumer recollection rather than program misrepresentation.

Importance of Reliability for Auditing.

In a discrepancy audit system, the importance of reliability in auditing a given content area is closely related to the purpose for auditing the content area. The elements specified within the framework reflect this inherent relationship. For each content area, a qualitative estimate of the degree of importance is provided as well as a rationale for the level that is derived from the purpose of auditing the content area.

1. Management. High. Even minor variations from the stated plan can cumulate into project-threatening events. The inability to communicate with groups external to the project can seriously damage the effectiveness of the project.

2. Development. Very high. If all other project functions are good, but the basic design of the program is unsound, there is no reason for implementing the project. If product testing does not occur incrementally during development, costly revisions may be necessary after the final field testing.

3. Demonstration. Very high. If project wares are not adequately developed

or available, the program cannot be disseminated effectively. Measures of service delivery determine the effectiveness of the dissemination and diffusion effort.

4. Developmental evaluation. Very high. If the evaluation design is not adequate, even the best of products may never be recognized as such. The objectives of the project must have a sound basis with sensitive, valid, reliable instruments for measuring the impact of the project. Without detailed evaluation procedures, implementation of the planned evaluation may never occur. The data analysis must be appropriate or the entire evaluation effort is uninterpretable.

5. Demonstration evaluation. High. Record-keeping and analysis of consumer reaction data is essential to diagnosis of inadequacies in the service delivery system. The final determination of the benefit of the project resides in the market impact evaluation.

Minimum Level of Reliability

Due to the lack of empirical evidence, establishing a minimum level of reliability necessary for the judgments of auditors in a discrepancy auditing system is very difficult. It was apparent that the minimum level for reliability in a system where the audit serves as a screening device would be lower than in a system where the audit is a final decision-making tool. However, to be an effective screening system, the original audit findings must permit considerable confidence on the part of the decision-maker.

The levels specified in the framework represent the best judgments of two experienced auditors, two Title IV-C state-level officials, and two experienced project directors. The range of the reliability coefficients was .6 to .9. In other words, the lowest acceptable proportion of the total variance attributable to true variance within the audit context was .6. The highest proportion of true variance to total variance expected was .9. These expectations were probably

strongly influenced by the experiences of the reviewers with expectations for reliability coefficients in the field of educational testing.

Discussion

Two limitations of the framework were identified. The first limitation was the inclusion in the framework of elements that may be specific to the Florida ESEA Title IV-C auditing system. Although generic terms were used for the audit content areas and reliability considerations, the specific details of the framework elaboration may include idiosyncrasies of the Florida system that do not apply to other auditing systems.

A second limitation noted was its development within an entire system for managing federal grant projects. The importance of the reliability of auditor judgments and the minimum level considered necessary is heavily influenced by the position of auditing within a system that includes many other checks on the developmental progress of projects. If the audit were the only or the final external evaluation of the project, a different auditing system would probably be more appropriate than a discrepancy evaluation system. Thus, the use of the framework in examining other auditing systems is limited to those employing a grants management review system.

The primary utility of the framework is in the identification of dimensions in program auditing that are related to and affected by the reliability of the judgments of program auditors. Further research in the area of program auditing should be based upon this kind of analysis of the importance of reliability in various content areas and of the factors affecting reliability of auditor judgments. These factors may coincide with those affecting the reliability of evaluator judgments in settings other than auditing.

An additional use of the framework is as a tool for examining reliability

considerations in other auditing systems. Although some of the terminology used in the elaboration of the framework is specific to the Florida ESEA Title IV-C system, the factors displayed are generic to any grants management system. Other grants management systems for federal, state, or local projects can use the framework as a basis for developing or revising an auditing system.

The framework developed in this study should be useful by decision-makers related to federal project in evaluating the function of program audits in a program development and management system. It should also facilitate examination of and empirical research about the interrelationships among auditing functions, reliability and the uses of information from audits.